W5YI

America's Oldest Ham Radio Newsletter

REPORT

Up to the minute news from the world of amateur radio, personal computing and emerging electronics. While no guarantee is made, information is from sources we believe to be reliable.

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The 1999 Amateur Radio Year in Review

Every year about this time we pause to reflect on what has happened to Amateur Radio during the past 12 months. Being tied to technology trends, ham radio is naturally changing. And 1999 was no exception! Here are what we feel were the major stories of the past year.

JANUARY 1999

● Reply comments closed on the FCC's *Notice of Proposed Rulemaking* to restructure the Amateur Radio Service, WT 98-143. The FCC proposed reducing the number of license classes from 6 to 4, and the ARRL agreed. But there was considerable support for having only three license classes: Technician, General and Extra Class. The ARRL wants two code exam speeds, 5 and 12 wpm while the VECs believe that the top speed should be 5 wpm. The League hinted that examinations might not even be necessary at all since only qualified operators would use CW and that proficiency was "self-proving." The ARRL also felt that the HF subband allocations available to the remaining license classes should be "refarmed" or realigned.

● The nation's frequency coordinators under the leadership of the National Frequency Coordinators Council (NFCC) continued to organize. A joint ARRL/NFCC petition for rulemaking was prepared by ARRL general counsel, Chris Imlay W3KD seeking to obtain FCC recognition of the NFCC in the rules. Suggested was a new Subpart G "Frequency Coordination" section to the Part 97 rules, which described the qualifications of Frequency Coordinators and their duties. But the ARRL's Board did not go along with the concept of mandatory coordination and the petition was never filed.

● At their January 15-16 Board meeting, the American Radio Relay League voted to come up with another name for the organization that would more accurately characterize the organization. An "Amateur Radio Technology Task Force" was also established to explore new technologies for the Amateur Service.

● The FCC continued its enforcement of Amateur Radio campaign after many years of being negligent in this area. W. Riley Hollingsworth, K4ZDH, the FCC's new ham radio enforcer even went on the amateur airwaves to confront those who the agency considers blatant offenders.

FEBRUARY 1999

● The FCC released a Notice of Proposed Rulemaking suggesting a new Low Power FM broadcast radio service that was first suggested by two ham operators, Nicholas Leggett N3NL of Reston, VA and Rodger Skinner W4FM of Pompano Beach, FL. The NPRM suggested three new classes of low power FM broadcasting, LP-10 (1-10 watts), LP-100 (100 watts) and LP-1000 (1000 watts.) The objective was to provide the listening public with a greater diversity of FM programming at a time when existing

FM broadcasters are consolidating. Citing interference concerns, the proposal was immediately and furiously opposed by existing FM radio stations and the National Association of Broadcasters. But potential low power broadcasters believe the real reason is that the nation's FM broadcasters do not want more competition.

● Ham radio's highest ranking and best known operator, Jordan's King Hussein JY1 died February 7th at age 63. Hussein was a life member of the ARRL. He had been active on Amateur Radio while receiving cancer treatment at Minnesota's Mayo Clinic. Hussein's widow, the American-born Queen Noor is JY1NH.

● The FCC pulled the plug on the San Francisco Bay area's "Grizzly Peak" 2-meter, 1¼-meter and 70-cm repeaters after it was learned that they were operating without control operators as required by the rules. The repeaters had been a haven for unlicensed operation, rebroadcasting of cordless telephone calls, playing music and profane and obscene language.

● A bill was introduced into Congress to protect Amateur Radio spectrum on February 23rd. The objective was to ensure that radio frequencies would continue to be available to the nation's ham radio operators. It was nearly a carbon copy of a bill that had been introduced a year earlier and never reported out of the House Subcommitee on Telecommunications.

MARCH 1999

● The Radioamateur Satellite Corporation (AMSAT) celebrated its 30th anniversary on March 13th. AMSAT was just an idea in 1969. In later years it went on to launch dozens of radio satellites in low earth orbit (LEO.) The LEO concept was later adopted by commercial satellite operators as a way to inexpensively provide telecommunications. Many LEO satellites arranged in a constellation can also act as an overhead platform from which worldwide communications may be provided without the annoying delay inherent in satellites in geosynchronous (stationary) orbit.

● FCC Chairman Bill Kennard announced plans to reorganize the FCC to reflect an era of competitive and converging telecommunications markets. Instead of being organized along technological lines, the agency will be restructured along functional lines. Currently the agency is divided into bureaus serving the wireline phone, wireless, cable, broadcast and international services. The new structure will feature such divisions as consumer protection, universal service, enforcement and spectrum management.

● The FCC announced on March 24th that it was slightly increasing the regulatory fee for "Vanity" call signs issued in the Amateur Service to $14.00 ...up from last year's $13.00 fee. Still a big reduction from the $50 Van-

ity call sign fee charged up until September 1998! The Vanity Call Sign System permits radioamateurs to select a call sign of their choosing subject to their license class and certain other qualifying rules.

APRIL 1999

● A major scandal involving international Amateur Radio surfaced in April. The Swatch Watch Company based in Switzerland announced plans to orbit a miniature "Sputnik-99": satellite that would promote its new global "Internet" time called "beat" time. The satellite which would operate on 2-meters (145.815 MHz) was built under contract by AMSAT-Russia who did not realize the commercial implications. To end the controversy, the "Swatch" satellite was launched in the "off" position and did not broadcast its commercial messages over Amateur Radio. Instead, they were "broadcast" on the Internet.

● On April 23rd, the FCC announced that as part of the new Universal Licensing System (ULS) Amateurs would have to register their Social Security Numbers (SSNs) with the FCC. All federal agencies have been mandated by Congress to collect the Taxpayer Identification Numbers (TINs) as part of the Debt Improvement Collection Act of 1996. Many amateurs objected to providing their SSN to the FCC but amateurs will not be able to obtain new, upgraded or renewed license without this information being provided. The Universal Licensing System is a new integrated system that consolidates all of the various radio service databases into one. ULS also uses only five forms and five "schedules" as opposed to the use of 41 forms under the prior system.

MAY 1999

● FCC enforcer, Riley Hollingsworth gave a well attended speech at the Dayton HamVention on May 16th. He said that the FCC was being "...as creative with enforcement as the people we are going after." He said that warning letters resolved most problems. The FCC is using evidence submitted by the amateur community ...especially the Amateur Auxiliary and the Official Observer Corps. It is also making use of short term license renewals and requiring amateurs to retake all of their VE administered examinations.

● Licensing of foreign Amateur Radio operation in the U.S. is now authorized by rule as long as a bi-lateral reciprocal licensing arrangement is in effect. No permit is issued, however, as previously was the case. The FCC recognizes the CEPT Amateur (European) and IARP, the International Amateur Radio Permit issued in certain ITU Region 2 countries. The Part 97 Rules have been changed to reflect these changes. CEPT Class 1 licensees receive Amateur Extra Class privileges in the United States, CEPT Class 2 operators may operate above 30 MHz.

● In the ULS Order, massive changes were made to

the way the FCC handles applications and licensing. All references in Part 97 to the FCC Form 610 (application form) were changed to FCC Form 605. References to application handling also has been transferred to Part 1 of the rules. Vanity call signs are now requested on Schedule "D" of Form 605 instead of FCC Form 610V.

• The United Kingdom announced on May 21st that it would be issuing a new Amateur Radio license that would confer all band (including HF) privileges with just a 5 words-per-minute Morse code proficiency requirement. Previously passing a 12 wpm code exam speed was required. The new "Full A/B" license utilizes call signs from the M5 prefix series followed by three letters. A 100 watt power level is authorized to "Full A/B" British licensees on HF, 400 watts above 30 MHz.

JUNE 1999

• Canada proposes to deregulate their ham radio by doing away with their Amateur station license. Instead, their Amateur Radio Operator Certificate which is being modified to include the operator's assigned call sign will be the sole operating authority. A side benefit will be the elimination of the license issuance fee and the $24 annual renewal fee. Canada also proposes to allow Amateur operators with a 5 wpm code proficiency to operate on 10 meters.

• On June 7th, the FCC issued a *Public Notice* activating a simpler way for U.S. radioamateurs to operate ham radio in certain foreign countries. As required by the European Radiocommunications Office (ERO), the document was issued in three languages, English, German and French. Basically the notice notifies participating European countries that U.S. licensed Tech Plus, General, Advanced and Extra Class operators qualify for European CEPT-1 (all band) privileges and that the Technician Class operator has CEPT-2 (VHF and higher) class privileges.

• The FCC's enforcement agent, Riley Hollingsworth K4ZDH began a campaign to crack down on the questionable hoarding of Amateur station club call signs. Many amateurs – especially those with Extra Class tickets - have applied for club call signs. Some hold dozens of call signs which are later traded in for preferential call signs such as those with a 1-by-2 format. Eventually hundreds of club calls would be recouped.

JULY 1999

• As authorized by the new ULS rules, the VECs issued a new NCVEC Form 605 that is to be used by the volunteer examining community. The new application form somewhat resembles the FCC Form 610 which has been discontinued. The new form was needed since the FCC Form 605 does not contain much of the information required by VEs. This form can also be used when VECs

renew your license.

• For the first time since the Inception of the VEC System, the Volunteer Examiner Coordinators canceled their summer National Conference held annually in Gettysburg, PA. This meeting is also attended by key FCC officials from their Washington, DC headquarters and the Gettysburg, PA licensing facility. The conference was postponed because the FCC had not yet issued the long awaited *Report and Order* on Restructuring of the Amateur Service, WT 98-143. The VECs had planned to discuss and set in motion a plan to implement the new Amateur Service line up of license classes and examinations at this meeting.

• Long time editor of CQ magazine, Alan Dorhoffer, K2EEK succumbed to the effects of cancer on July 19th at age 61. He was replaced by Rich Moseson, W2VU effective with the November issue. Rich had been the editor of CQ's sister publication, CQ VHF for the past four years. Effective with the January issue, CQ and CQ-VHF were merged into a single expanded publication.

• Three Amateur astronauts aboard the STS-93 space shuttle returned to earth on July 27th. Commander Eileen Collins KD5EDS, Michel Tognini KD5EJZ and Catherine Coleman KC5ZTH spoke to school children in Virginia, Texas an Florida from orbit in what would become the last of a series of 25 SAREX, Shuttle Amateur Radio EXperiments.

AUGUST 1999

• The new Class A/B all-band license took effect in the United Kingdom on August 2nd. The new license requires only 5 words-per-minute code proficiency and authorizes 100 watt operation. The A/B license is designed to act as an intermediate step between the no-code Class B (VHF and higher frequency) license and the full privilege Class A ticket. The UK's Class A license requires 12 wpm skill and authorizes 400 watt power.

The *Radio Society of Great Britain* – the UK's national Amateur Radio society – also went on record as opposing mandatory Morse testing at any speed in exchange for access to the ham bands below 30 MHz.

Sweden went a step further. They eliminated two of their four license classes and dropped their 12 wpm code exam speed to 5 wpm. Sweden now has only a full privilege Class 1 and (no code VHF and higher) Class 2 line up. Both classes authorize up to a 1 KW power level.

• On August 12th, the FCC Chairman told Congress that it would be restructuring the agency along functional lines rather than offices that manage specific radio services. The *FCC for the 21st Century* will be reorganized into new bureaus which may be named Enforcement, Consumer Information, Licensing, Competition and Policy ...and International Communications. The first two new

bureaus were activated in November ...with the remaining restructuring to be completed within 5 years. Congress said that timetable was too slow.

● On August 16th, the FCC converted the old Amateur Service database of licensees into the new Universal Licensing System format. VECs were required to change their electronic application filing system to coincide with the needs of ULS. Until the FCC creates Club Call Sign Administrators, the old FCC Form 610-B is still to be used to establish Amateur Radio clubs and to renew Club and Military Recreation licenses.

● The FCC denied and dismissed several *Petitions for Reconsideration* addressing various aspects of the FCC's *Order* implementing the new *Universal Licensing System*. ULS consolidates all radio services into one database. Among other things, the Commission affirmed that radioamateurs are not exempt from the requirement that *Taxpayer Identification Numbers* be supplied to the FCC as part of the licensing process. TINs can be either an applicant's Social Security Number (SSN) or their corresponding *Licensee ID*. The FCC did, however, relent on the handling of e-mail addresses and telephone numbers which will now be an "optional" application item.

SEPTEMBER 1999

● The FCC amended the Part 97 rules to permit Amateur Radio operators to use any method of Spread Spectrum (SS) coding. SS is a modulation technique that distributes the signal over a very wide bandwidth according to a predefined formula. Previously only frequency hopping and direct sequence coding was allowed. SS transmitter power level must not exceed 100 watts. If more than 1 W is used, automatic transmitter controls must limit power to the minimum needed for the communications.

OCTOBER 1999

● On October 8th, the International Phase 3D amateur communications satellite was accepted for launch as a secondary "standby" payload aboard an upcoming Arianespace (European space agency) launch from Kourou, French Guiana. AMSAT-Germany president, Dr. Karl Meinzer, DJ4ZC said the launch could come as early as the first half of the year 2000. The amateur satellite – will transmit on several ham bands – was constructed through the cooperation of amateurs around the world. AMSAT-NA President Keith Baker said "Once it is in orbit, the Phase 3D satellite will not only help us usher in the new millennium, it will also signal the dawn of a brand new era for Amateur Radio."

● The United Kingdom said they plan to allow their radioamateurs to link 5-cm radio frequencies to the Internet using RLANs. Radio Local Area Networks are high bandwidth, high data-rate mobile or portable equipment operating in the 5-cm band. Officials at Great Britain's *Radiocommunications Agency* said that limited access to the Internet over amateur spectrum could be in operation by the end of the year.

NOVEMBER 1999

● The FCC reallocated 75 MHz of spectrum to *Intelligent Transportation Systems* on October 21 and another 200 MHz of prime spectrum to new wireless technologies on November 18th. ITS includes a broad array of short-range line-of-sight wireless links between vehicles traveling at highway speeds and various roadside systems. The never-before-allocated 200 MHz was appropriated from the federal government spectrum stockpile. Most Amateur Service frequencies at the VHF and higher frequency range are shared on a secondary basis with other users and it is not clear what impact these allocations will have on future Amateur access. The bands in question are the 5-cm, 13-cm and 1¼-m bands.

DECEMBER 1999

● Amateur Radio growth continues slow. At year end 1999 there were about 677,000 U.S. licensed radioamateurs versus 674,000 at the end of December 1998. The good news is that there were 10,000 more Technician Class operators. The bad news is that the license classes that require Morse code exams decreased by 6,500. And VECs reported 20 percent less applicants were administered Amateur Radio license examinations in 1999 ...and 50 percent less than just five years ago. California continued as the state with the most ham operators, more than 103,000. But, for the first time ever, had less than the year before.

● George Wilson, W4OYI - an ARRL president until he suffered a stroke a few years ago – startled the Amateur community by announcing on December 1st (in a public newsgroup posting entitled "What and When") that the FCC's new Amateur Service restructuring *Report & Order* would "...be released [the] last business day before Christmas [and that it would contain] two, possibly three classes." According to Wilson, the new lineup would be effective January 3rd with a 5 words-per-minute maximum CW speed for the General Class. "Novice, Tech+ and Extra go away. [with] Lots of grandfathering up. No one loses any privileges."

The three class structure with the Extra Class being jettisoned is interesting. We assume he means that the Advanced Class would become the all-privilege top-of-the line ham license ticket.

We doubt this is true -- especially when you consider that any rule change has to be in the *Federal Register* at least 30 days before it can be effective, and it hasn't even been released yet. If George knows something we don't, then the R&O release date is to be December 23rd. Since Christmas falls on Saturday this year, December 24th is a government holiday. But it does appear that release of the *Report and Order* may be imminent. We will keep you posted.

CUTTING EDGE TECHNOLOGY

■ **Enough old electrical wiring exists now that it takes a special type of experience to determine how to repair circuitry** in buildings that are many decades old. Often a building wasn't designed to handle electrical wiring when it was built, and shortcuts had to be made (many of which are behind walls and not noticed unless you look for them). When working on old buildings, an electrician can't be certain that what should be, is in fact what's in place. Modernizing a building can mean rewiring and replacing worn out sockets, lights and switches. The National Electrical Code has been modified many times over the years. Because of demand, books and other training methods are available to show electricians how to upgrade old electrical circuits to today's specifications.

■ **Open up a power supply or large amplifier and you may not find any power resistors inside.** They're still there, though; they just don't look like the standard sandstone resistors of old. Caddock Electronics is one firm that is packaging power resistors into cases that look like standard TO-247 power transistors. This allows for better heat transfer, because such a package can be bolted to a heat sink and thermal grease can be applied.

■ **Repetitive attaching and removing an edge connector can shorten its service life.** Even if the contacts are gold-plated, friction removes tiny pieces of the top layer and corrosion can begin in the metal underneath. NyeTact makes a lubricant for such applications; you just brush it onto the edge-connector contacts and it greatly reduces wear and tear.

■ **How much cable is really on that spool?** Rather than guess, you can quickly check and find out for sure with a cable length meter. Basically a special time-domain reflectometer, it measures how long a signal takes to bounce back from one end of the cable to the other, and back. Once you tell the meter what type of wire you're measuring, it does the rest. An installer can determine if he needs an extra roll, whether it's 15 feet or several miles.

■ **If you can't protect it, filter it.** Liquid crystal displays (LCDs), like everything else in the world, have their good points and bad points. While they are very easy to read in daylight, their internal organic materials make them susceptible to weakening (or even failure) from exposure to ultraviolet light. If you've ever left a digital multimeter exposed to direct sunlight for several hours and found the LCD completely blacked out, that's why. (Heat plays a strong role, too; LCDs don't like heat any more than we do, but allowing them to cool off in a dark room for a while often returns the displays to normal.) If UV exposure is unavoidable, consider installing a filter.

■ **Are you hoarding old circuit boards in the hopes of salvaging the gold on them?** You might be better off collecting aluminum cans. A ton of PC boards often yields at most only four or five ounces of gold. (And a salvager probably won't even pay you that much.)

■ **Diamonds conduct heat? Yep, and they do it very well.** The heat-sink grease so common in homebrew circuitry (and even professional circuits) is usually made from silicone. But high-end manufacturers sometimes use a heat-transfer material that provides an even lower thermal resistance. Diamond-filled greases are among the best at this, but -- you guessed it -- they cost too much for most applications.

■ **Speaking of diamonds and heat, Edmund Scientific sells an electronic diamond tester.** The handheld device tests the thermal conductivity of a stone, whether it's mounted or loose. If the light or buzzer doesn't turn on, the "diamond" is a fake.

■ **A diabetes wristwatch detector has been approved by the FDA for use by adult diabetics.** The Gluco-Watch works by sending tiny electric currents through the skin to measure glucose levels every 20 minutes - even while patients are sleeping. Eliminated are those painful finger-pricks to check blood sugar levels. The device sounds an alarm if patients' blood sugar hits dangerous levels. Approximately 16 million Americans have diabetes. < http://www.cygn.com >

■ **As sodium lights age, they become susceptible to a peculiar problem they appear to burn out, then mysteriously "heal" themselves temporarily.** This comes from a street lamp winking off for a few minutes, cooling off enough in the process for the ballast to restart it. Then the lamp stays on for a little while longer, then shuts off again. The process repeats until the bulb fails for good. Several community traffic departments found out about this the hard way, sending crews out to replace a "bad" bulb that appeared to be good when they got there.

■ **Surface-mount light-emitting diodes (LEDs) take up much less space on a circuit board** than their standard big brothers, but they have a problem detrimental to their function they are so tiny that the light they produce can be difficult or impossible to see. Chassis design may preclude the use of surface-mount LEDs if their light can't penetrate the casing. That's why "light pipes" made of transparent plastic function as a way of delivering light from the miniature diodes to the outside world. They offer wide viewing angles and a variety of lengths.

■ **Ever wonder how those flashing light-emitting diodes (LEDs) in today's running shoes work?** They flash every time you take a step. Originally, a tiny mercury switch controlled each LED. Then, when health officials complained that the liquid metal could leach out of landfills after the shoes were thrown away, shoe manufacturers switched to a ball-bearing-type switch. Each time the metal bead rolls against two metal finger contacts, the battery-operated circuit connects and the LED lights up.

■ **Speaking of LEDs, the LEDtronics company is selling them in a new method of packaging an array of LEDs** set in a semicircle to snazz up your latest project. The Crescent Bargraphs contain 15 individual light-emitting diodes in a variety of colors. They can indicate volume levels, signal strength, or whatever else you can dream up.

■ **"The AA-Deathgrip"** With operating voltages getting smaller, the power supplies in many new handheld electronic devices need every millivolt they can get. In an effort to get rid of the voltage drop between batteries and their usual spring-force connectors, new high-pressure contacts are coming into play. They can withstand the high currents demanded in this new technology.

■ **When radio frequencies get high enough, hollow waveguides work better for power transfer than solid wire -- the skin effect.** Polymicro Technologies is doing the same with hollow fiber-optic cables. The "silica waveguides"

help deliver infra-red laser light by coating the inside walls with reflective films.

■ **Some people take to working at home, and others don't.** Some companies try to save money and keep employees happy by offering to let them work at home ("SoHo" is a slang term for "small office/home office"), but after a few weeks the novelty can wear off and productivity could suffer. Will you miss the companionship of your coworkers? Will you become bored? Psychologists have actually created personality tests for businesses to help determine which employees might stay happier at home and who might like office work better.

■ **Audiovox Corp. combines a TV and visual baby monitor for the kitchen.** The VE-500 attaches to the bottom of a kitchen cabinet and the flat-panel display can be rotated for best viewing angle. A wireless video camera (offered separately) can provide security for other rooms in the house, the garage, or even the outside yard.

■ **"Matching the load to the source" can work with cooking food as well as adjusting an antenna.** A microwave oven is basically an RF transmitter and a waveguide. Since most RF transmitters aren't designed to have their output contained in a small, shielded room, however, engineers have come up with computer software to simulate the behavior of RF inside a microwave oven. Ovens of different physical sizes require "fine tuning," as it were, and field patterns within behave in different ways.

■ **And you can soon bake things in a microwave oven.** The FlashBake uses a special interior coating to deliver the RF to all surfaces of the object being cooked. "Dead spots" in conventional microwave ovens are eliminated due to the 97% reflectivity of the new coating. .

■ **So many people in the technical field have received the Microsoft Certified Systems Engineer (MCSE) designation through less-than-honest means** that some employers feel that the value of the MCSE is shrinking. Web sites with chunks of the question pool, and plenty of companies "graduating" unqualified people create a flood of applicants with no hands-on experience. Microsoft is working on shutting down those Web sites containing "cheat sheets" and says their new MCSE exams for Windows 2000 will be more difficult and extensive.

■ **To speed up data transfer on a large computer network, try using an Excellerator 800 FC.** It's a device that simulates a hard drive but works much faster. It stores data in huge banks of RAM instead of on hard-disk platters. RAM is much quicker to access. Files that are used often can be stored inside the Excellerator and downloaded almost instantly. All data inside is protected against loss due to power failure.

EMERGING COMMUNICATIONS

■ **Real time television programming on the Web is not legal in the United States but it is in Canada.** A new free service called iCraveTV.com rebroadcasts TV signals in a small window in the corner of your Web browser. To get around international copyright laws, the user must certify that they are located in Canada. U.S. television networks are not happy with the new service.

■ **You won't believe the millions of sound effects that are available these days.** Radio stations, audio production houses and other users can purchase sound effects on compact discs from the BBC, Hanna-Barbera, Warner Brothers and LucasFilm. With decades of experience behind them, each company has collected or generated every noise or sound imaginable. Each set contains at least five or six discs (the BBC library totals 40) and an index. So if you're strolling down memory lane, you can get sounds from Bugs Bunny, the Flintstones, Dr. Who and Star Wars -- all digitally remastered.

■ **The Dick Tracy watch will be with us shortly.** Swatch Telecom of Switzerland is readying "SwatchTalk" - a wireless watch/phone. The watch rings when a call comes in and you push a button on the face to talk. Cost will be about $350.00. The wireless watch won the *Best Technology Award* at CeBIT, the world's largest electronic trade fair held annually in Hannover, Germany. The high tech show attracts some 720,000 visitors to see over 7,000 exhibitors from around the world. <www.swatch.com>

■ **Television stations and networks are slowly archiving programs onto digital cassettes** that take up far less room than the videotapes they've been using in the past. An entire season of episodes for a sit-com can be stored now on one cassette the size of a dinner plate, and uploaded and downloaded to affiliates in compressed form for shorter transmission times. A server computer as small as a water cooler can replace an entire room full of old videotapes.

■ **Personal virtual reality video screen.** Sony has just introduced their Glasstron PLM-A35 Video Goggles that, when worn, make you feel like you are watching a 52-inch big screen TV set with stereo sound from a simulated six-foot distance. The 180,000 pixel display shows clear and precise detailed video images on two full color one-half inch LCD screens. The 3.5-ounce wrap-around goggles can be connected to a DVD player, VCR, TV screen, video game, camcorder or a computer. Cost is $599. See it at <www.sel.sony.com> Sony says it is ideal for watching DVD movies from your laptop computer on long flights.

■ **If you've got an old analog television under the bench, you may want to hang on to it for posterity...** or for scanning the upper reaches of the UHF band. The FCC is re-allocating top channels of UHF TV in the U.S. to public safety and wireless microphones. Channels 60 through 69 (746-806 MHz) will be officially switched over to their new duties by the end of 2006. (Channels 70 through 83 were reassigned to land-mobile service in the early 1980s.)

■ **You don't have to be just on the ground to use GPS.** Other satellites can use it to keep track of their whereabouts, too. A GPS tracking system is being tested for use on board the Space Shuttle for backup purposes.

■ **Every transmission line has a certain frequency that it doesn't like for one reason or another.** Self-resonance or absorption often requires engineers to stay away from those frequencies if they expect to deliver a signal reliably. This property also holds true, interestingly enough, for fiber-optic cables. One common wavelength – 1383 nanometers – can cause trouble because that's the absorption frequency caused by water that may have collected in the fiber when it was made.

■ **If you're a fan of '70s rock groups such as The Who and Emerson, Lake and Palmer,** you may fondly remember the sounds generated by the synthesizers of the time. Those old analog synths were tough to keep in tune because

they drifted with age and temperature, and weren't really designed to be taken on the road. They also weren't designed to be attached to computers with MIDI (Musical Instrument Digital Interface), so common to synths today. Rather than completely re-engineer these old units, modern manufacturers have built digital units (rack-mounted or keyboard-based) that re-enact those old sounds. They don't drift or otherwise go out of tune, and can be quickly attached to computers or other synths. They're much lighter and easier to adjust... and several different models of synths are now packed into one unit.

■ **Every continent on the planet (except Antarctica) is connected to the others via undersea fiber-optic cable.** Almost 300 separate trans-oceanic cables are already in use or under construction. Today's Internet could not exist without them.

COMPUTER INFO

■ **The cost of computing measured in millions of instructions per second, or MIPS** fell 98.5 percent from $230 in 1991 to $3.42 in 1997. And the price per MIPS is expected to fall below a dollar this year, and to about one-fifth of a cent within a decade. This decline in computing costs is credited with reducing inflation by more than a full percentage point in 1997.

■ **Head-mounted graphics displays are getting smaller and cheaper.** MicroOptical Corp.'s EyeGlass Displays take an unusual approach. The image is generated not by a tiny CRT or LCD, but by tiny mirrors. The mirrors are modulated in the X and Y planes, and image intensity is synchronized to create a raster display. The entire device weighs less than 50 g and is easily attached to eyeglasses or safety glasses. The wearer can therefore see everything around him as well as a computer-generated image in his field of vision. This allows easier, quicker access to test equipment data (such as oscilloscope traces) or anything else a PC can generate. A cable connects the EyeGlass Display to the computer (wearable or otherwise).

■ **Powerful software takes time to learn.** Rather than pore over a thick manual for hours on end, why not ask the software itself? Extensive programs, such as design software, are now incorporating semi-intelligent "help" modules that allow the user to type in complete questions and instantly receive clues on where to look in the built-in index. Enter a question such as "How do I draw an ellipse?" and a box pops up on the screen with that particular help topic.

■ **High-end software packages cost a great deal of time and money to develop and debug.** Manufacturers are therefore eager to protect their investment by making sure the software they sell can't (and therefore won't) be copied. Many schemes have been tried over the years. But one company that makes CAD (Computer-Aided Drafting) software uses an interesting technique. You must attach a hardware lock (a software-specific device that usually attaches to the printer port) that communicates with the software. After completing the first half of installation, the hardware lock returns a special sequence of code numbers. You fax these code numbers to the manufacturer. Once they certify that it's a legitimate copy of their program, they then fax back the special authentication codes you need to complete the entire installation.

■ **Xybernaut Corp. has come up with a small, lightweight (2 pound) wearable PC that is either touch or voice activated.** It is worn on your belt and is particularly useful for those people who need to consult a PC on the fly – such workers reviewing maintenance manuals, conducting inventories in the field or ordering online while up a telephone pole.

The PC includes a set of studio-quality headphones with a protruding arm that covers one eye. A tiny (1.1 inch) screen at the end of the arm projects an image onto a mirror, which reflects into the user's eye. Other accessories include a wrist-mounted keyboard or a head-mounted video camera. A consumer-targeted version will be available in 2000 at about $3,000. <www.xybernaut.com>

■ **When it is not okay to upgrade to the newest computer hardware and software?** When you're in charge of an assembly line. Each upgrade of Windows, for example, usually means an upgrade in your hardware as well. It's not uncommon to totally change all of your hardware every two years, if not faster. But most assembly lines controlled by computers are designed to last at least 10 years. And often the new software isn't compatible with the old hardware that does the work.

Will there be patches available? Maybe. Maybe not. An upgrade into an operating system that turns out not to work with your old equipment may in fact not allow you to re-install the old programming. Then what do you do? That's why many factories run old equipment until it breaks. It's reliable and dependable.

■ **The 3-ounce QuickLink Scanner Pen from Wizcom Technologies lets you scan lines as it moves across text like a highlighter.** The information can later be downloaded into your computer. A small screen on the side of the $150 hand-held device lets you view up to three lines of scanned text at a time.

Wizcom also has developed a "Quicktionary ReadingPen" that uses advanced text-to-speech-technology to read back scanned text. It also doubles as a dictionary and can define up to 200,000 words listed in the American Heritage dictionary. <www.wizcomtech.co>

■ **A new method of mapping human motion into computer animation makes use of an array of video cameras and reflective targets on an actor's body joints.** With each camera receiving a two-dimensional plot of the dots of light from the targets, special software coordinates the maps into a three-dimensional model of human motion. The actor isn't tied down with wires and can move freely.

■ **Most hams sell or trade their old electronic and computer equipment at swap meets and flea markets.** But most other folks try to unload their outmoded computers, printers and video monitors to libraries and charitable organizations. Nowadays, it's a good idea to ask said organizations if they really want all of it. Some schools and the like can't use old computer gear and won't accept it.

■ **A new self-updating computer virus, called Babylonia, is being offered to Internet users disguised as a Y2K glitch fix.** The virus, released when the program is executed, downloads still more destructive payloads from a web server in Japan once the PC makes an Internet connection. The virus is initially distributed by email and over chat rooms.

Another new virus - called the "Mypics worm" - is set to go off January 1, 2000. More than six new virus programs preying on the Y2K bug and the new millennium have already been identified by anti-virus firms. The bottom line. Don't open suspicious programs sent to

you as emails on your computer and constantly update and run your virus software.

On the other hand, there are virus hoaxes. Three shareware computer games -- ElfBowling, Frogapult, and Y2KGame -- have become the target of a virus fraud. A message being circulated by email warns users not to open these games, but experts say they are not infected.

■ **A so-called "smart" refrigerator makes use of computer technology to track internal heat flow.** It logs how often the door is opened, the placement of food and storage objects within, and outside air temperature to automatically adjust the inside air flow to eliminate "hot" spots.

■ **With more and more travelers using laptop computers aboard airplanes, airlines are looking seriously at offering data ports in airline seats that will allow almost direct Internet hookups.** Satellite connections will be the most practical way to do this, but in the interest of saving money, a mail server aboard the airplane may collect e-mail coming and going and exchange it only in "bursts," spaced several minutes apart.

■ **Human nature dictates that a person required to repeat the same string of words over and over subconsciously speeds up his or her speech rate, usually making those words hard to understand in the process.** Airlines are trying to ease the burden on their flight attendants by letting computer-recorded messages tell the passengers pre-flight information. Music can be played throughout the cabin during boarding in this manner, and messages in dozens of other languages can be stored and played as well at the touch of a button. Diction is perfect every time, and no one misunderstands safety instructions.

INTERNET NEWS

■ **If your Internet service seems a tad slow, don't instantly blame your provider.** It may simply be bogging down from the load of "junk" e-mail, commonly referred to as "spam." Experts say at least 10% of all e-mail traffic is spam. If it were to disappear, it would greatly speed up network bandwidth and soothe shortened tempers. (Some spam doesn't have a reply address, so trying to reply to it only causes your message to

bounce back and forth all over the network, slowing down service even more.)

■ **"If you can't find it, you ain't lookin' hard enough."** Internet search engines are supposed to search the entire World Wide Web for the topic you specify, but in most cases they don't. There isn't a single search engine that can do it all, so it pays to use several. One study says that most of them don't search even one-fifth of all the data that's available. It's not entirely their fault, though; things change so fast on the Web (sites come and go at the push of a button) that it's practically impossible to search it all at once.

■ **According to InfoMove, a customized Internet content provider, most new cars sold in five years will be connected to the Internet.** Drivers will be online all of the time. Your car will act as your personal secretary and read back your schedule for the day from a Web page. You will also get customized music and other up-to-the-minute information ...such as personalized news, stock quotes, weather, directions and reminders downloaded from the Web.

■ **In 1994, three million people used the Internet.** Year-end 1998 figures indicate more than 147 million people worldwide were accessing the Internet at least once a week from home or business. The number of Internet users is projected to grow to approximately 320 million by 2000, and to 720 million by 2005. Traffic on the Internet is doubling every 100 days.

■ **Shutterfly.com is Jim Clark's newest startup company.** Clark is the founder of such companies as Silicon Graphics, Netscape and Healtheon. Shutterfly is a Web site that turns digital photos into prints. They process digital images uploaded by customers and mail out 35-mm quality prints for fees ranging from 49 cents for a 4 x 6 inch print to $4.99 for an 8 x 10. You cen even add a personal message to be printed on the back of the photo.

WASHINGTON WHISPERS

■ **Holiday sales over the Web are booming!** Online sales for 1999 could reach $50 billion - and most of it without accompanying sales taxes added! At the San Francisco meeting of the congressio-

nally appointed *Advisory Commission on Electronic Commerce* held Dec. 14th and 15th , state and local governments adamantly appealed for a national sales tax on Web sales..

According to a survey by *Advertising Age* trade publication, the busiest sites are Amazon.com, Toys"R"Us, eToys, CDnow, Buy.com, barnesandnoble.com, egghead.com, Kbkids.com, JCPenny and Gap.com.

■ **Technology mutual funds are also booming!** The average Tech fund is up 66% this year – several up over 100%! This compares to 11% for all other diversified funds – which is their historic average over the last few decades . Generally, the more high-tech and communications investments a fund had this year, the higher was its return. Demand for technology funds by investors and stocks by fund managers are driving up prices creating high volatility and risk. The big question is what happens if and when the merry-go-round slows down.

AMATEUR RADIO

■ **All Belgian Amateur Radio stations have been granted the use of the prefix OT** from 2300 UTC on the 3rd of December 1999, until 2300 UTC on the 3rd of January 2000. This is to celebrate the wedding of Prince Philip and Princess Mathilde [pronounced Matilda]. *[Thanks RSGB]*

■ **The FCC is looking into a W5YI-VEC coordinated examination session held on July 14, 1999 in Clemson, SC.** Riley Hollingsworth is particularly interested in learning the circumstances surrounding the upgrading of William J. Browning AF4PJ of Pendleton, S.C. to Amateur Extra Class.

Browning, then KE4BWS, upgraded his General Class license at a second session held after he acted as team leader at his regular examination session held earlier in the day at the same location. The team leader for the second session was Eugene D. Watring, AF4DB who had been asked to assist Browning with both exam sessions.

Three additional volunteer examiners, Maurice "Dale" Martin KT4NY, Grady P. Robinson AK4N, and Mikel T. Blackwell N4OPD have furnished signed letters to the W5YI-VEC stating that they did not participate in either examination session nor were they at the session. Two of

these VE's, Grady Robinson and Mikel Blackwell are shown as VE's on the upgrade applications of William J. Browning, Frank D. Cox KF4UJQ (Williamston, SC), Joseph A. Cox KF4RMH (Williamston, SC) and James F. Chambers KF4PWF (Greenville, SC).

Gene Watring said he was asked by Browning to assist at the exam session which he agreed to do. When he got to the exam site, he was introduced to the other VE's whom he did not know. Copies of the letters from the volunteer examiners who said they did not participate at the July 14th Clemson, S.C., have been turned over to Riley Hollingsworth.

Hollingsworth has now required William J. Browning, Frank D. Cox, Joseph A. Cox and James F. Chambers to retake all of their license examinations up to and including the current license they hold by January 31, 2000.

In addition, Eugene Watring, Mikel Blackwell, Dale Martin and Grady Robinson have been sent copies of the application Form 610s that they supposedly certified and have been asked to respond to several questions concerning their alleged activity at the Clemson, SC examination session.

The FCC is also looking into a license examination session held May 2nd in Yonkers, N.Y. where it is alleged examination irregularities took place.

■ **The FCC has canceled nine club call signs issued to Leonard J. Pringle KH8A (Extra Class) of San Ramon, CA.** Pringle held the following club call signs:

W7NV	White Porcelain Radio Network, NV
W6LP	White Porcelain Radio Network, CA
KH8DX	Fituita Amateur Radio Society
K6JJC	Computer Controlled Communic.
KF6JZR	Koth Radio System
K6KK	OF RadioNetwork
K6RPT	High Level Link System
KF6SYM	Discovery Peak DX Club
KL1A	Alaskan DX Club

Pringle was asked last August 18th to justify the need for each of the call signs within 30 days. The club calls were invalidated when no response was received by the Commission.

■ **Asterio W. Marrero, AA2RF of Trujillo Alto, Puerto Rico has had his Extra Class license downgraded to Technician.** He had been ordered to retake all of the Extra Class examination requirements by Sept. 15th – later extended to Oct. 15 and again to Oct. 30.

Marrero appeared for the examination but failed to pass Element 4A or 4B. He submitted a physician's statement in lieu of the code test. The FCC pointed out that the 5 word-per-minute telegraphy examination had to be passed in some way and that a physician's statement of handicap cannot be used to waive the basic 5 wpm code examination.

■ **The Advanced Class license of Jose M. Chavez, KE4ZUD of Hialeah, FL** has been downgraded to General Class. Chavez had been ordered to retake the Advanced Class examinations by June 15th - later extended to Nov. 1, 1999 at the Tampa, FL field office. He passed only the elements required for the General Class.

■ Six more amateurs have been ordered to retake all of their passed examinations. **Lonnie H. Allen, N0TNO of Crane, Missouri,** must retake the General Class examinations at the Kansas City, MO FCC field office. **Richard W. Ruiz Vale, NP3YY of Corozal, PR** must retake the General Class examinations at the San Juan, PR FCC field office. **Michael W. Delich, WA6PYN of San Francisco, CA** must retake the Advanced Class examinations at the Hayward, CA FCC field office. **Raphael Ayala, KC2ALT of Brooklyn, NY** must retake the Extra Class examinations at the San Juan, PR FCC field office. **Michael Lowden, N9LAT of Crestwood, Illinois** must retake the Technician examinations at the Park Ridge, Illinois FCC field office. And **David R. Aguilar, Jr., W7EIB of Golden Valley, AZ** must retake the General Class examinations before an ARRL VE team.

■ **Jose M. Lora, KC2ECO of New York City** did not appear to retake the General Class exams by Nov. 22nd and has had his license canceled by the FCC.

■ The FCC has advised **Roger G. Morgan, KB5URM of San Antonio, TX** - that it had evidence that he was continuing to operate transmitting equipment in his area. Morgan had his Technician Plus license canceled on August 30, 1999 for failing to appear for re-examination as previously ordered. "Continued unlicensed operation will result in a monetary fine ...and seizure of your radio transmitting equipment...," the FCC said.

■ The FCC warned Darren Turk, **KC8CYG (Technician Class) of Parma, OH** and **Darrell Berg, N0KED (Gen-** eral Class) of Eden Prairie, MN that they have monitoring evidence that they have been deliberately and maliciously interfering with ongoing Amateur repeater and network communications ...and transmitting unidentified transmissions.

The FCC said "Additional incidents of this type ...will result in a monetary fine being levied against you ...in revocation proceedings before an Administrative Law Judge ...and seizure of your transmitting equipment."

■ **David Flanagan, WA6FCW (Advanced Class) of Capo Beach, CA** was advised by the FCC that it has evidence indicating he played music on 7.258 MHz. He was ordered to retake all license examinations up to and including the Advanced Class at the Hayward, CA FCC field office..

■ **Feaster B. Ashley, K4MFU (General Class) of Walterboro, SC** was also formally warned by the FCC that it had evidence that he has been making transmissions without proper identification.

■ **FCC enforcement agent Riley Hollingsworth, K4ZDH, will be the keynote speaker at the Dayton Hamvention banquet** on Saturday, May 20. The (May 19-21) Hamvention 2000 will also host the ARRL National Convention for the first time ever. Hollingsworth, licensed 39 years, holds an Advanced class ticket. He also belongs to the Quarter Century Wireless Association and the Radio Club of America, the nation's oldest radio organization. For more information on Dayton Hamvention 2000, visit http://www.hamvention.org, e-mail info@hamvention.org or call 937-276-6930 weekdays 10 AM-5 PM.

■ **The Foundation for Amateur Radio has issued a press release** advising that it will be awarding 73 scholarships for the 2000-2001 academic year.

Licensed radioamateurs may compete for these awards if they plan to pursue a full-time course of studies beyond high school and are enrolled or have been accepted for enrollment at an accredited university, college or technical school. The scholarships range in value from $500 to $2500 with preference given in some cases to certain geographical areas.

Additional information and an application form is available from: FAR Scholarships, P.O. Box 831, Riverdale, MD 20738.

U.S. SEEKS TO NARROW THE "DIGITAL DIVIDE"

A few months ago *(W5YI Report, Sept. 1, page 10)* we did a story on the telephone as a measure of prosperity. Pointed out was the fact that 80% of the world's people have no access to a telephone.

By sharp contrast, telephone penetration rates among U.S. households stands at slightly more than 94%. Generally, telephone penetration correlates directly with income. Only 78.7% of the lowest-income households have telephones. When a household earns more than $75,000, 98.9% own phones.

While telephone penetration has remained fairly stable across the nation, significant changes have occurred for personal computer ownership and Internet access. For the latter two categories, household rates have soared since 1994 for all demographic groups in all locations. These increases indicate that Americans across the board are increasingly embracing electronic services by using them in their homes.

Despite increasing PC ownership and Internet connectivity for all groups, however, a growing "digital divide" exists among minority, low-income households, single parent and those in rural America. Higher-income, highly educated, or dual-parent households have rising PC and connectivity rates.

Nationwide, PC ownership at the end of 1998 stood at 42.1%, up from 24.1% in 1994 and 36.6% in 1997 (an increase of 74.7% and 15.0%, respectively). Internet access has also grown significantly. As of the end of 1998, 26.2% of U.S. households have Internet access, up from 18.6% in 1997 – an increase of 40.9%. In 1998, Internet access increased 52.8% for White households, 52.0% for Black households, and 48.3% for Hispanic households.

Despite these gains across American households, distinct disparities in access remain. PC and Internet penetration rates both increase with higher income levels. Households with an income over $75,000 are more than *five times* as likely to have a computer at home and are more than *seven times* as likely to have home Internet access as those with an income under $10,000.

As with telephone penetration, race also influences connectivity. Americans with Asian heritage have the highest computer penetration (55.0%) and Internet access rates (36.0%), followed by White households (46.6% and 29.8%, respectively). Black and Hispanic households have far lower PC penetration levels (at 23.2% and 25.5%), and Internet access levels (11.2% and 12.6%).

Households at higher education levels are far more likely to own computers and access the Internet than those at the lowest education levels. Those with a college degree or higher are more than *eight times* as likely to have a computer at home (68.7% versus 7.9%) and are nearly *sixteen times* as likely to have home Internet access (48.9% versus 3.1%) as those with an elementary school education.

Computer ownership lags among single-parent homes, especially when a female heads the household (31.7%), compared to married couples with children (61.8%). The same is true for Internet access (15.0% for female-headed households, 39.3% for dual-parents).

Age also plays a role. While seniors have the highest penetration rates for telephones, they are dead last to all other age groups in computer ownership (25.8%) and Internet access (14.6%). Households in the middle-age brackets (35-55 years) lead all others in PC ownership (nearly 55.0%) and Internet access (over 34.0%).

The region where a household is located also impacts its access to electronic services. The U.S. West is the clear-cut leader for both computer penetration (48.9%) and Internet connectivity (31.3%). At the other end of the scale is the South with 38.0% PC ownership and 23.5% for Internet access.

As with telephones, computer and Internet penetration varies among states -- from Alaska with a high of 62.4% and 44.1% to Mississippi's low at 25.7% and 13.6%.

Similar to telephone penetration, electronic access comes hardest for Americans who are low-income, Black/Hispanic/Native American, less educated, single-parent, young heads-of-households, and who live in the South, rural areas or central cities.

But unlike the phone profile, senior "have nots" are less connected in terms of electronic access. And Asian Americans lead all races with respect to computers and Internet access that they have not enjoyed in telephone comparisons.

The U.S. government is very concerned about the widening digital divide. The gap between the information "haves" and "have nots" is growing over time. Between 1997 and 1998, the gap between White and Black households *increased by 53.3%* (from a 13.5 percentage point difference to a 20.7 percentage point difference), and *by 56.0%* (from a 12.5 percentage point difference to a 19.5 percentage point difference) between White and Hispanic households.

Households at higher education levels are now also much more likely to own computers and access the Internet than those at the lowest education levels. In the last year, the divide between the highest and lowest income groups grew 29.0% (from a 42.0 to a 52.2 percentage point difference) for Internet access.

On the positive side, it is apparent that *all* Americans are becoming increasingly connected -- whether by telephone, computer, or the Internet. On the other hand, it is also apparent that certain groups are growing far more rapidly. This pattern means that the "haves" are becoming more information-rich, while the "have nots" are lagging even further behind.